

DOCUMENT RESUME

ED 479 093

SE 068 290

TITLE Safety in the Elementary Science Classroom.
INSTITUTION National Science Teachers Association, Arlington, VA.
ISBN ISBN-0-87355-224-5
PUB DATE 2003-00-00
NOTE 25p.; Colors may not photograph well.
AVAILABLE FROM NSTA Press, 1840 Wilson Blvd., Arlington, VA 22201-3000. Web site: www.nsta.org.
PUB TYPE Guides - General (050)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS
DESCRIPTORS Elementary Education; *Hazardous Materials; Laboratory Safety; *School Safety

ABSTRACT

This guide gives elementary school teachers suggestions for providing a safe environment for their students and covers general safety concerns in the science classroom. Information is printed in a flip chart format for easy reference. Safety areas covered include: (1) In Case of Accident; (2) Eye Protection; (3) Plants in the Classroom; (4) First Aid; (5) Animals in the Classroom; (6) Field Trips; (7) Fire Prevention and Control; (8) Storage and Labeling; (9) Safe Use of Equipment and Materials; and (10) Safety Checklist. (MVL)

ED 479 093

Emergency 911 or _____
Fire Department _____
Police Department _____
Poison Control _____
School Nurse _____
School Principal _____
School Safety Officer _____
School Science Supervisor _____
School Address _____
School Phone _____

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
This document has been reproduced as
received from the person or organization
originating it.
☐ Minor changes have been made to
improve reproduction quality.
• Points of view or opinions stated in this
document do not necessarily represent
official OERI position or policy.

—SF068290

PERMISSION TO REPRODUCE AND
DISSEMINATE THIS MATERIAL IN MICROFORME
AND IN ELECTRONIC MEDIA FOR ERIC
COLLECTION SUBSCRIBERS ONLY.
HAS BEEN GRANTED BY
S. Huber
TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)
2A

Safety

in the Elementary Science Classroom

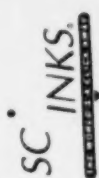
BEST COPY AVAILABLE

26



See back cover for information on using

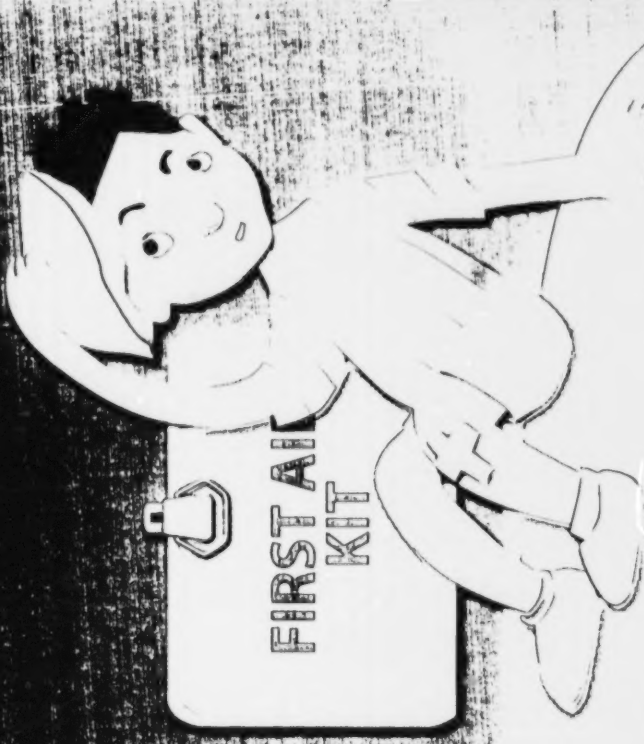
NSTA is committed to publishing quality materials that promote the best in inquiry-based science education. However, conditions of actual use may vary and the safety procedures and practices described in this publication are intended to serve only as a guide. Additional precautionary measures may be required. NSTA and the author(s) do not warrant or represent that the procedures and practices in this publication meet any safety code or standard or federal, state, or local regulations. NSTA and the author(s) disclaim any liability for personal injury or damage to property arising out of or relating to the use of this publication including any of the recommendations, instructions, or materials contained therein.



Topic: **safety in the classroom**
Go to: www.sclinks.org
Code: ESFOI



Phone
Book



Make sure each student's emergency contact numbers are handy in your grade book and in the school office. In the event of accident or injury, immediately take the following steps:

- 1 If there is a possibility of serious injury:

M

55

BEST COPY AVAILABLE



- a Immediately obtain medical help by calling a predetermined emergency number, or the police or fire department.
 - b Give first aid according to your school district's policy. Do not treat or provide medication.
 - c Establish contact with the parent or guardian as soon as possible and urge that he or she contact the family physician immediately.
 - d If you are not able to reach parents or guardian, contact the alternate person designated and/or the family physician directly.
- 2 Notify the school principal and, if you have one, the school nurse.
 - 3 Follow your school's rules on Standard Precautions for dealing with bodily fluids. Only designated school personnel who have been vaccinated for hepatitis should have contact with body fluids or cleanup.
 - 4 Have a properly trained person administer first aid, if necessary.
 - 5 Be sure a parent or guardian has been notified in any accident.

These recommendations may vary with individual schools. Follow the specific procedure for your school.

Notes _____



Several types of eye safety devices exist:

- Goggles protect against impact and splashes and reduce dust and fumes near the eyes.
- A face shield provides partial protection for the face against impact and splashes.
- A safety shield provides group protection from splashes and impacts.

BEST COPY AVAILABLE

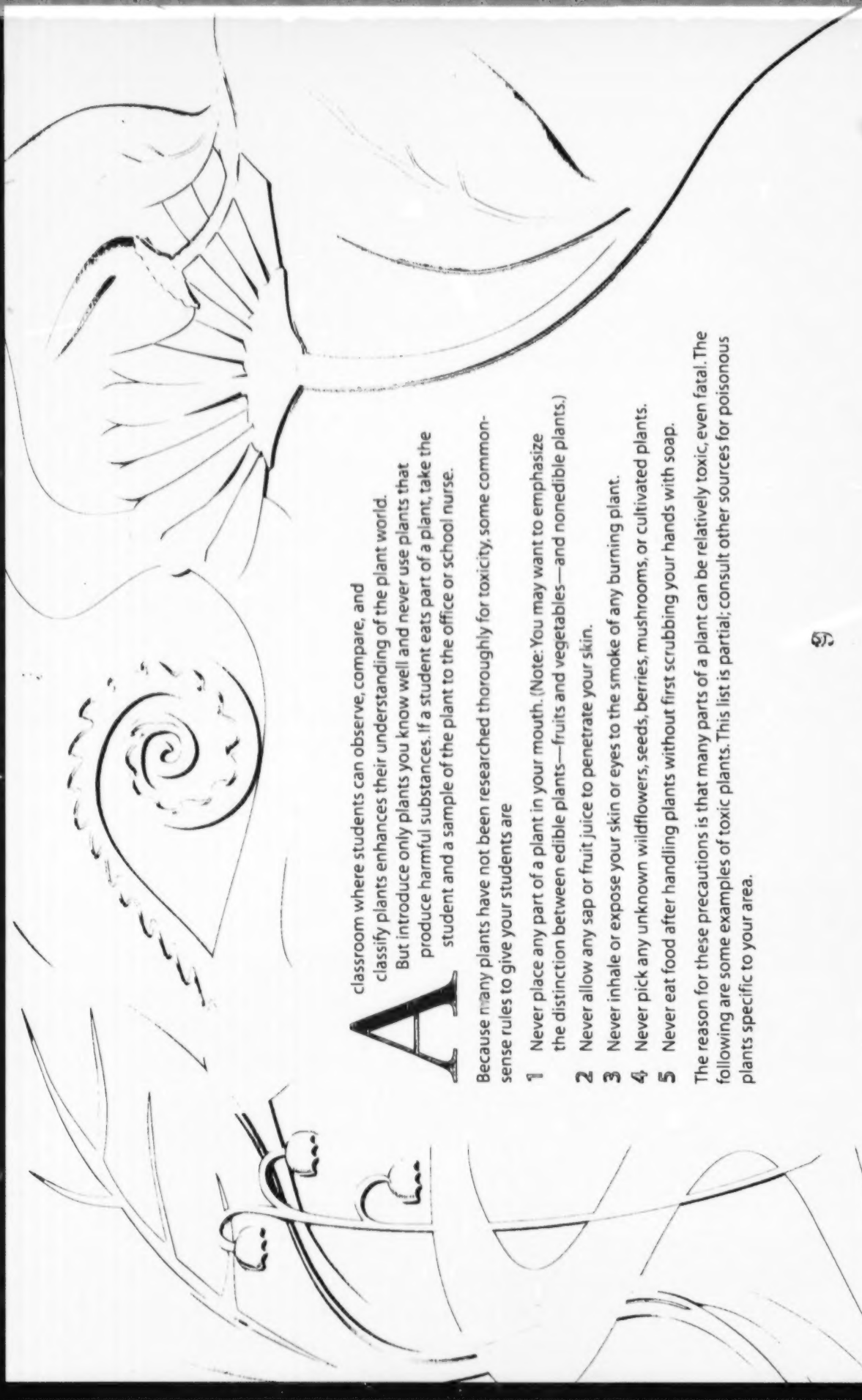
These devices should not be considered 100 percent effective against eye hazards. Combinations of devices should be used for the best protection. Make sure any eye safety device is in good condition and that it fits.

To establish an effective eye safety program, teachers should:

- 1 Become fully aware of state eye protection equipment legislation and comply with it.
- 2 Be certain that eye protection equipment meets ANSI Z87.1 safety standards. Look for the ANSI Z87.1 stamped on the item.
- 3 Introduce students to the need for eye protection devices, and emphasize the importance of using them.
- 4 Consider eye safety when planning each science activity.
- 5 Make sure everyone performing science activities that involve possible eye hazards wears approved protection devices of the proper size and style. Everyone in the lab during such activities also must have eye protection.
- 6 Maintain a policy for distributing, storing, and sanitizing goggles. If students cannot be assigned their own goggles, goggles should be sanitized after each use. Antibacterial dish soap works well.
- 7 Maintain strict standards for cleanliness. If a blindfold is used, it should never be used on more than one child. Eye diseases are highly contagious.
- 8 Demonstrations involving possible danger to the eyes should be arranged to shield students and teachers from any danger. A safety shield should be used to protect everyone in the general area, and a face shield and/or goggles should also be used.

Reference: ANSI Z87.1 (1989). *Occupational and Educational Eye and Face Protection*. American National Standards Institute, Inc., 1430 Broadway, New York 10018.

Notes



A

classroom where students can observe, compare, and classify plants enhances their understanding of the plant world.

But introduce only plants you know well and never use plants that produce harmful substances. If a student eats part of a plant, take the student and a sample of the plant to the office or school nurse.

Because many plants have not been researched thoroughly for toxicity, some common-sense rules to give your students are

- 1 Never place any part of a plant in your mouth. (Note: You may want to emphasize the distinction between edible plants—fruits and vegetables—and nonedible plants.)
- 2 Never allow any sap or fruit juice to penetrate your skin.
- 3 Never inhale or expose your skin or eyes to the smoke of any burning plant.
- 4 Never pick any unknown wildflowers, seeds, berries, mushrooms, or cultivated plants.
- 5 Never eat food after handling plants without first scrubbing your hands with soap.

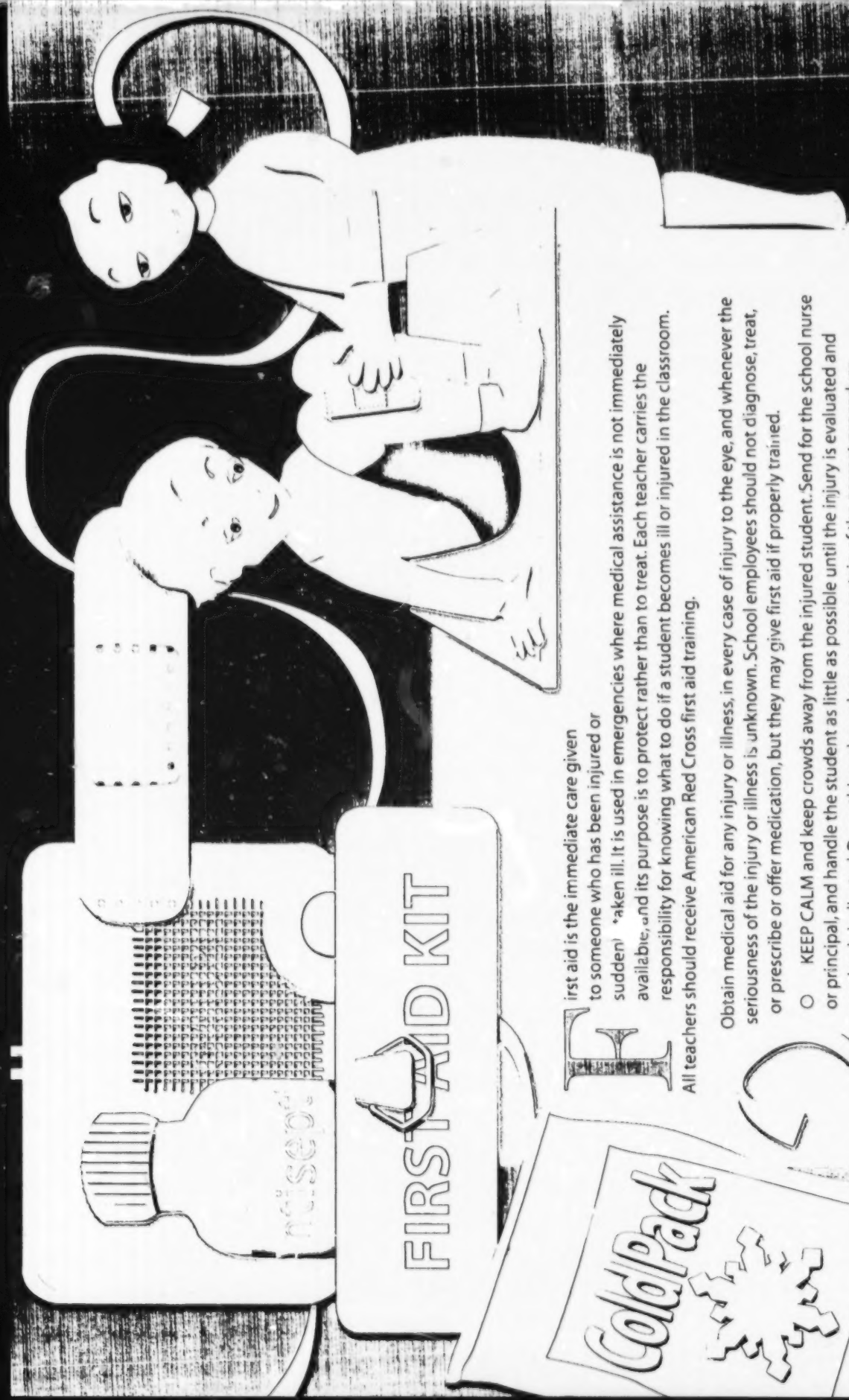
The reason for these precautions is that many parts of a plant can be relatively toxic, even fatal. The following are some examples of toxic plants. This list is partial; consult other sources for poisonous plants specific to your area.



- A** Plants poisonous to the touch due to exuded oils are:
- 1 Poison ivy (*T. radicans*; *R. diversiloba*)
 - 2 Poison oak (*R. quercifolia*; *T. diversilobum*)
 - 3 Poison sumac (*R. vernix*)
 - 4 Oleander (*N. oleander*)
 - 5 Yew (*T. baccata*)
 - 6 Other _____
- B** Plants poisonous when eaten include:
- 1 Many fungi (*mushrooms*)
 - 2 Aconite (*A. napellus*)
 - 3 Belladonna (*A. belladonna*)
 - 4 Wake robin (genus *Trillium*)
 - 5 Henbane (*H. niger*)
 - 6 Pokeweed (*P. americana*)
 - 7 Tansy (genus *Tanacetum*)
 - 8 Foxglove (*D. purpurea*)
 - 9 Indian tobacco (*L. inflata*)
 - 10 Jimson weed (*D. stramonium*)
 - 11 Poinsettia (*E. pulcherrima*)
 - 12 Mistletoe (*V. album*)
 - 13 Other _____
- C** The saps of the following plants are toxic:
- 1 Oleander (*N. oleander*)
 - 2 Poinsettia (*E. pulcherrima*)
 - 3 Trumpet vine (*C. radicans*)
 - 4 Other _____
- D** Be aware that many common houseplants are toxic.
- 1 Poinsettia (*E. pulcherrima*)
 - 2 Dieffenbachia (*D. maculata*)
 - 3 Castor bean (*R. communis*)
 - 4 Mistletoe (*V. album*)
 - 5 Lantana
 - 6 Other _____
- 6** Never transport plants across state lines or release exotic plants into the wild.
- 7** Be aware that some students are allergic to mold, mildew, and other fungi. Use only commercial potting soils.

Reference: *AMA Handbook of Poisonous and Injurious Plants* (1985). Kenneth F. Lampe and Mary Ann McCann, AMA, distributed by Chicago Review Press, Chicago, IL.

Notes _____



FIRST AID KIT

First aid is the immediate care given to someone who has been injured or sudden taken ill. It is used in emergencies where medical assistance is not immediately available, and its purpose is to protect rather than to treat. Each teacher carries the responsibility for knowing what to do if a student becomes ill or injured in the classroom. All teachers should receive American Red Cross first aid training.

Obtain medical aid for any injury or illness, in every case of injury to the eye, and whenever the seriousness of the injury or illness is unknown. School employees should not diagnose, treat, or prescribe or offer medication, but they may give first aid if properly trained.

- KEEP CALM and keep crowds away from the injured student. Send for the school nurse or principal, and handle the student as little as possible until the injury is evaluated and moving is indicated. Do nothing else unless you are certain of the correct procedure.

BEST COPY AVAILABLE

- Be aware of your school's Standard Precautions procedures. There are designated personnel to deal with body fluids and spills.

RESTORE BREATHING using one of the methods listed below in which you have sufficient training:

- a Mouth-to-mouth (mouth-to-nose) method
 - b Cardiopulmonary resuscitation (CPR)
 - c Techniques for clearing obstruction of the airway (Heimlich maneuver)
- Consult your school's policy on Standard Precautions when dealing with bleeding. Otherwise, STOP BLEEDING —slight, moderate, or massive—by following these steps:

- a Wear latex or similar gloves to minimize risk of infection from the blood. Be aware of possible allergies to the gloves.
- b If bleeding is severe or profuse, it must be stopped before other aid can be given. Apply a large -ompress to the wound with direct pressure, using the heel of the hand.
- c If the cut is slight and bleeding is not profuse, remove all foreign material (glass, dirt, etc.) projecting from the wound, but do not gouge for embedded material. Wash with large amounts of water and apply a sterile dressing.
- PREVENT SHOCK with the following procedures. Symptoms are paleness, cold and moist skin with perspiration on the forehead and palms of the hands, nausea, shallow breathing, and trembling.
 - a Place the injured student in a reclining position with the head lower than the body, unless the student is having difficulty breathing.
 - b Control any bleeding by applying direct pressure.
 - c Wrap student with blankets, coats, paper, etc.
 - d Keep the student's airway open.

Reference: *The American Red Cross First Aid and Safety Handbook* (1992). Little Brown & Co., Boston.

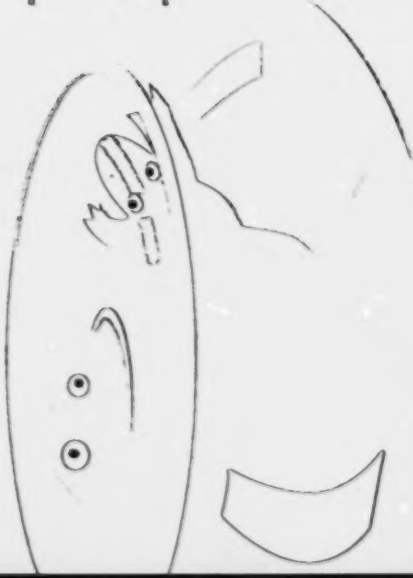
Notes

FOR WORLD'S & CLICK AWAY
Topic: first aid
Go to: www.scilinks.org
Code: ES502

BEST COPY AVAILABLE

12

First Aid



Before introducing animals into the classroom, check the policy of your school district. When animals are in the classroom, make sure neither students nor animals are harmed. Points to consider and rules you may wish to adopt:



- 1 Do not allow poisonous animals to be brought to school.
- 2 Do not allow students to bring live or dead wild animals—including snapping turtles, snakes, insects, arachnids (like ticks or mites), or roadkill—into the classroom. These can transmit diseases (like Lyme disease and hantavirus).
- 3 Do not house animals with high dander levels like rabbits and guinea pigs, because they produce allergens that persist in the classroom.



- 4 Watch for ticks and mites on birds, even though they were purchased.
- 5 Before allowing animals in the classroom, check school district policy to be sure you are complying with local regulations. Local humane society or zoo personnel will often help teachers create a wholesome animal environment.
- 6 Obtain all animals from a reputable supply house or licensed pet shop. Fish should be purchased from tanks in which all the fish appear healthy.
- 7 Provide animals with properly sized living quarters. Animals must be kept clean and free from contamination and remain in closed, well-ventilated cages. Make provisions for their care on weekends and holidays.
- 8 Use heavy gloves for handling animals, and have students wash their hands before and after they handle animals.
- 9 Take care with mammals—they protect themselves and their young by biting, scratching, and kicking.
- 10 Discourage students from bringing personal pets to school. If they are brought into the room, fresh water and a place to rest. Pets should not be disturbed while they eat. Never allow several different personal pets at the same time.
- 11 On a field trip, tell students to avoid picking up or touching unfamiliar animals.
- 12 Caution students never to tease animals or to insert their fingers or objects into wire mesh cages. Report animal bites and scratches immediately to the office. Provide basic first aid.
- 13 Rats, hamsters, and mice are best picked up by the scruff of the neck, with a hand placed under the body for support. If young are to be handled, remove the mother to another cage—by nature she will be fiercely protective.
- 14 Before you bring an animal into the classroom, make a plan for its eventual return. Never release exotic (pet store) animals into the wild.

Reference: *Classroom Creature Culture: Algae to Anoles* (1993). National Science Teachers Association, 1840 Wilson Blvd., Arlington, VA 22201.

Notes

SC/INKS

Topic: safety in the classroom

Go to: www.sclinks.org
Code: ESFO1

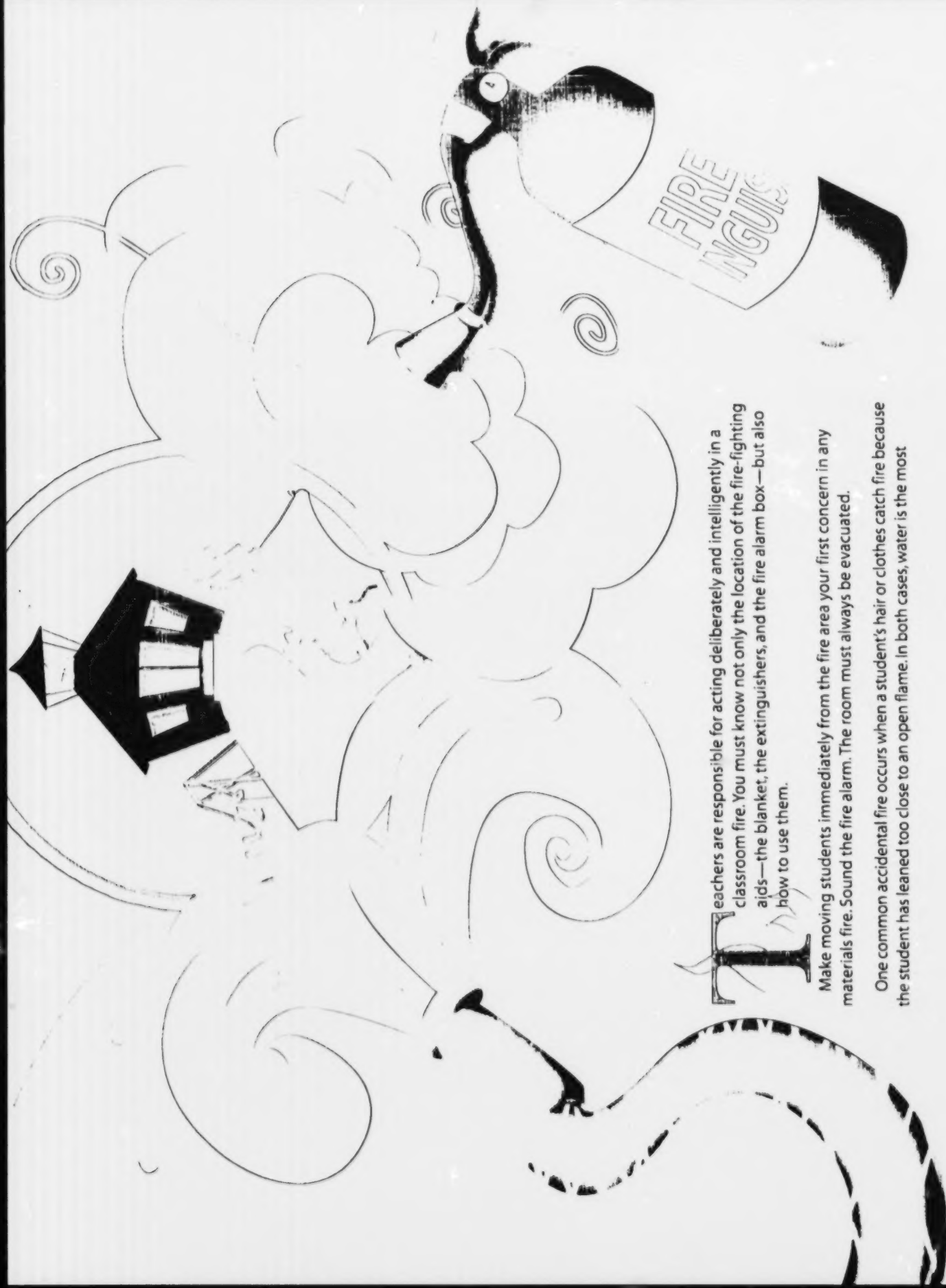


Field trips are valuable, positive additions to the elementary science program. A good field trip is well planned, with educational objectives identified and activities planned to reach those objectives. With careful organization, the possibility of accidents is greatly reduced. A few relatively simple precautions can improve safety.

- 1 Thoroughly check the environment before bringing students to a site. Ask owners or proprietors about specific hazards. Make sure you tell them about any students with special physical needs.
- 2 Never take anything for granted where students are concerned. Always be alert for the unexpected.

- 3 If possible, at least one responsible adult, known and approved by the school administration, should accompany the teacher and students on the trip.
- 4 Bring a cell phone.
- 5 Keep the adult/student ratios at no greater than 1:10. Special education students may require supervision outside this ratio. Trips to water or other hazardous sites or that involve climbing or sampling require more supervision.
- 6 Get parental permission before allowing a student to go on a field trip. On the permission slip, ask parents to note any health concerns—allergies, medications, etc.—and emergency contact numbers. Bring these slips on the field trip.
- 7 Send home a list of the proper clothing to be worn and the necessary equipment or supplies to be taken.
- 8 Pair students with buddies to help protect each other.
- 9 Tell students to wear clothing that covers their legs and arms to minimize the risk of mite and tick infestation (which may cause diseases such as Lyme disease), plant poisoning, or scrapes.
- 10 Check first aid kits to see they contain the essential first aid items.
- 11 Do not go to any body of water unless at least one person in the party is familiar with the latest methods of artificial respiration and the rules of ordinary water safety described in first aid handbooks, scouting manuals, and American Red Cross literature.
- 12 Make sure students taking trips near or into the water of a stream, river, lake, or ocean learn first to recognize dangerous aquatic or marine plants and animals common to the area.
- 13 The buddy system is particularly important during a trip involving wading. Life jackets should always be worn.
- 14 Make sure trips to factories and laboratories are well supervised and that an experienced representative conducts the tour.
- 15 Make sure you have a list of student medications and allergies.

Notes



Teachers are responsible for acting deliberately and intelligently in a classroom fire. You must know not only the location of the fire-fighting aids—the blanket, the extinguishers, and the fire alarm box—but also how to use them.

Make moving students immediately from the fire area your first concern in any materials fire. Sound the fire alarm. The room must always be evacuated.

One common accidental fire occurs when a student's hair or clothes catch fire because the student has leaned too close to an open flame. In both cases, water is the most

effective remedy. A fire blanket to smother the fire also can be used. Do not use a CO₂ fire extinguisher on a person. A CO₂ blast could spread the fire and possibly cause frostbite, compounding the burn.

Fire Fighting

There are four general classes of fire. Using the proper type of extinguisher for each will provide the best control. Fire extinguishers are labeled with the class or classes of fire they should be used on. They must be checked regularly—before a fire occurs—to make sure they are charged. The classification of fires here is based on the type of material being consumed. Multipurpose A, B, and C fire extinguishers are available for school and home.

Class A—*Fires in wood, textiles, paper, and other ordinary combustibles.* This type of fire is extinguished with water or a solution containing water (loaded steam) that wets down the material and prevents glowing embers from rekindling. A general-purpose dry chemical extinguisher is also effective.

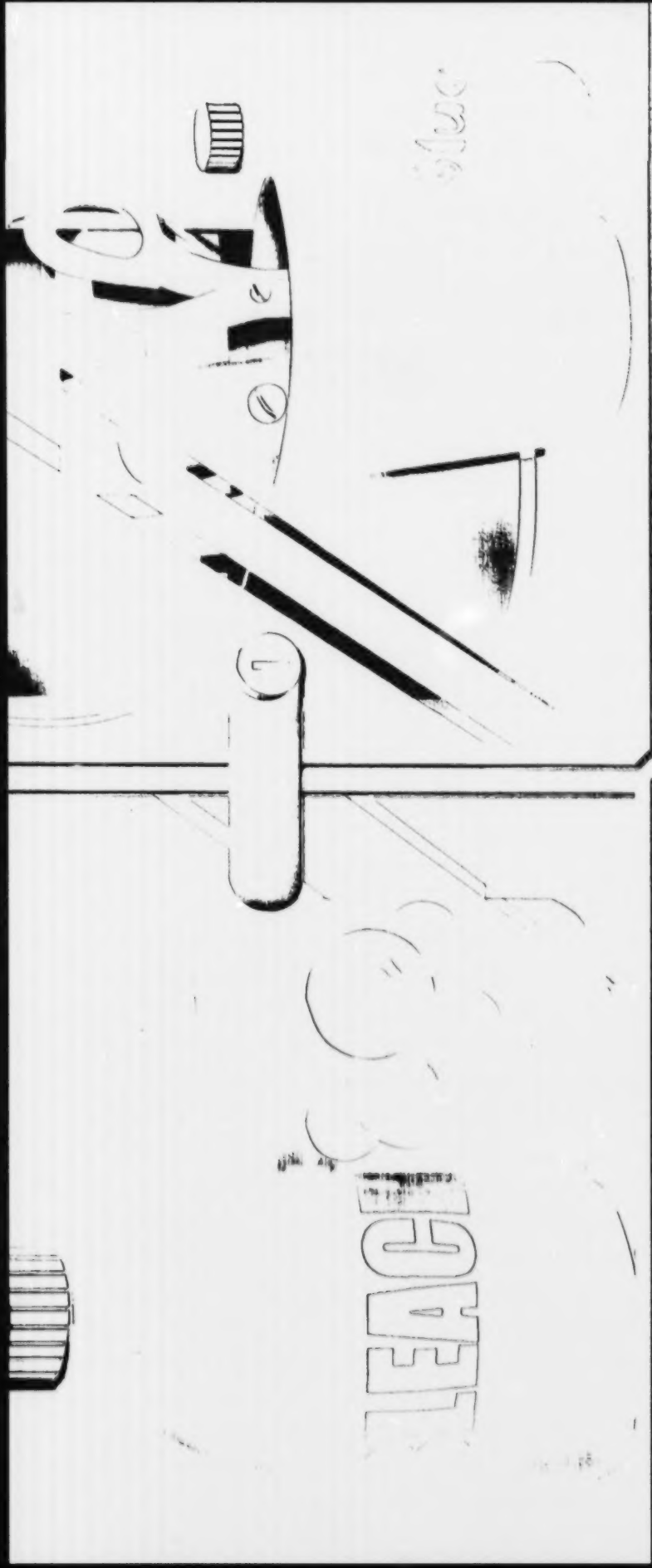
Class B—*Fires in gasoline, oil, paint, or other flammable liquids that gasify when heated.* This type of fire is extinguished by smothering—shutting off the air supply. Carbon dioxide, dry chemical, and foam extinguishers are effective on this type of fire. To use a dry chemical or carbon dioxide extinguisher, pull the pin, point the nozzle at the flame, and squeeze the handle. Do not hold the horn of the carbon dioxide extinguisher with your hands; use the handle because the carbon dioxide causes supercooling of the horn. To use a foam extinguisher, invert the extinguisher and point the nozzle so the foam floats over the fire; do not point the stream at the flame. This extinguisher does not have a cut-off valve and must be completely expelled.

Class C—*Fires in live electrical equipment.* This type of fire is extinguished by using a nonconductive agent. A carbon dioxide extinguisher smothers the flame without damaging the equipment. A dry chemical extinguisher is also effective. Whenever possible, the source of power to the burning equipment should be cut off.

Class D—*Fires in combustible materials such as magnesium, titanium, zirconium, sodium, potassium, and others.* This new and somewhat specialized classification is extinguished by a special extinguisher powder, which is applied by a scoop. Dry sand may also be used to extinguish small Class D fires. Apply by scoop.

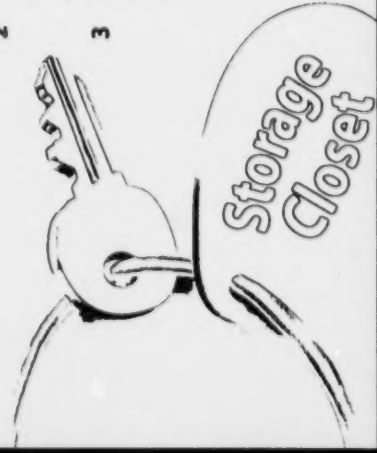
Reference: *Fire Protection Handbook*, NFFPA, 18th edition (1997), National Fire Protection Association, Quincy, MA.

Notes _____



oor storage invites accidents. Adequate, efficient storage is essential for safety in the classroom. Keep in mind the following when storing equipment and materials:

- 1 **Area** Enough space should be available so there is no crowding. Shelving should be deep enough that articles are not easily dislodged. A bar on the shelf edge helps prevent items from falling off.
- 2 **Height of Storage Shelves** Always store chemicals, large glassware, and heavy articles on a lower shelf that is not accessible to students. When shelving cannot be reached from a standing position, a stable step stool should be available and used.
- 3 **Quantities** Maintain only a select group of chemicals and only in small quantities (a one-year supply is recommended). Don't store anything you don't need or anything that is not appropriate for your own curriculum.



- 4 **Locks** Many simple substances, even cleaning supplies, are toxic. Keep them behind a locked door.
- 5 **Containers** Keep materials in easily handled containers that are appropriate and approved for the material they contain. For example, keep acids in small bottles rather than in large gallon jars.
- 6 **Placement of Hazardous Materials** Store volatile liquids away from sunlight, electrical switches, or heat sources. Reacting chemicals should not be stored near each other. Keep hazardous materials under separate lock.
- 7 **Labeling** At the elementary school level, it is prudent to label both the storage area where equipment and materials are stored and the individual items. Marking pens or electric engravers can be used to identify equipment by name. Usually, temporary labels are appropriate for containers used for materials. Labels for all chemical containers should include the date of purchase. Never accept old material from another class, school, or any other source.

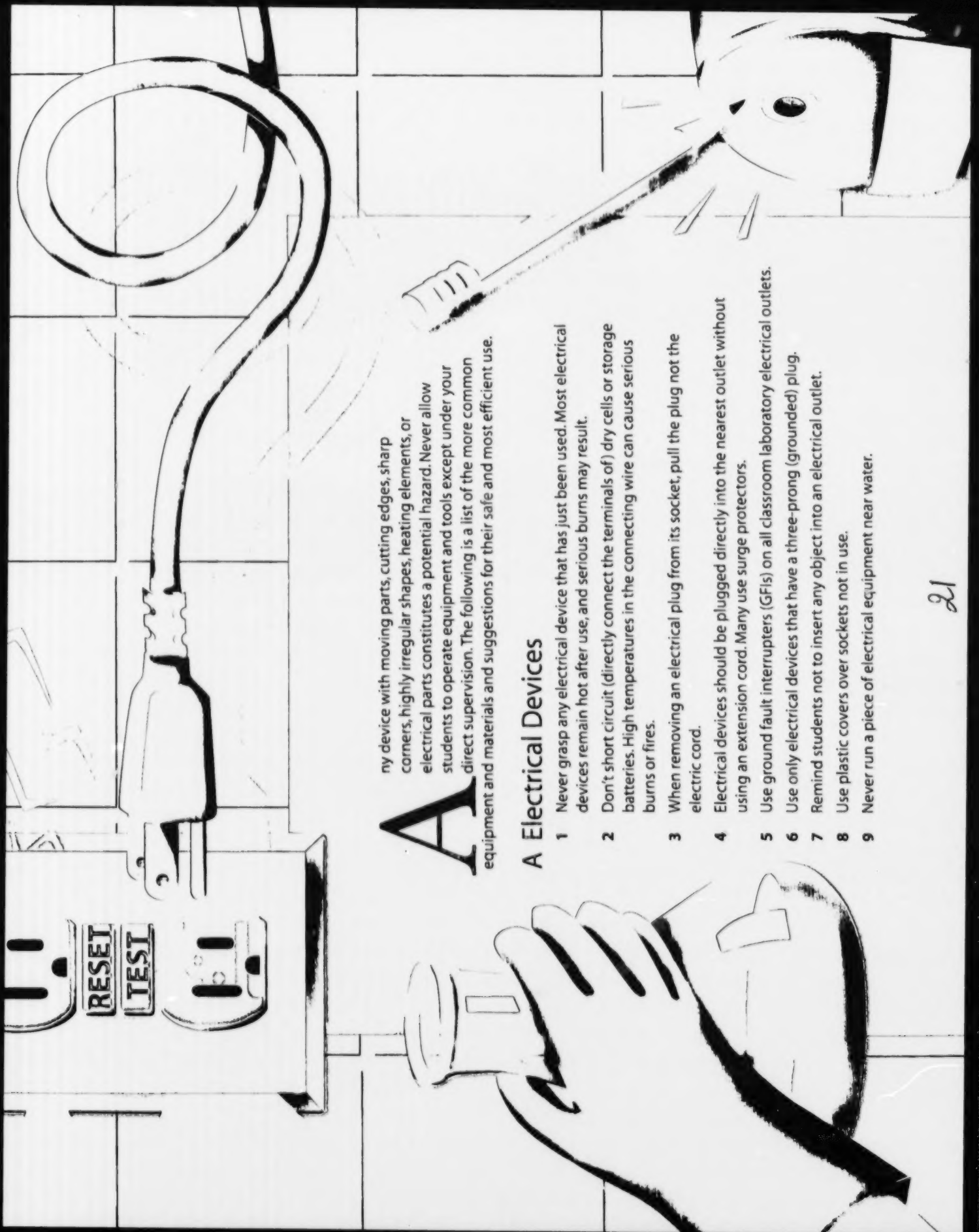
Only the teacher should dispense substances for student use and only in such quantities that all the substance will be used. Pouring dry chemicals or liquids back into the original containers will almost certainly contaminate the entire supply. Material safety data sheets (MSDSs) on all chemicals used or stored should be kept both in the room and in the school office.

Use alternatives to dangerous or highly concentrated chemicals: vinegar for acid, baking soda for base, etc. Chemicals should be identified by common name as well as the scientific name, formula, precautions for use, and antidote. Following school district regulations, carefully discard substances if they have lost their labels or if there is any confusion about their identity. They should never be used in experiments.

Store liquid in separate storage areas, not near equipment or other materials. Storage should be separated further by placing acids, bases, and salts in separate areas. Volatile substances, if any, should be placed in a cool storage area that has proper ventilation.

- 8 **Transportation and Control** Develop a system for transporting equipment and materials to the classrooms. A rolling cart with lips on each shelf is highly recommended. It should be lockable. Hazardous materials should be transported through the halls only under the direct supervision of a teacher wearing safety equipment and when few or no students or other people are in the halls. Maintain a method for checking in and checking out materials and supplies.

Notes _____



Any device with moving parts, cutting edges, sharp corners, highly irregular shapes, heating elements, or electrical parts constitutes a potential hazard. Never allow students to operate equipment and tools except under your direct supervision. The following is a list of the more common equipment and materials and suggestions for their safe and most efficient use.

A Electrical Devices

- 1 Never grasp any electrical device that has just been used. Most electrical devices remain hot after use, and serious burns may result.
- 2 Don't short circuit (directly connect the terminals of) dry cells or storage batteries. High temperatures in the connecting wire can cause serious burns or fires.
- 3 When removing an electrical plug from its socket, pull the plug not the electric cord.
- 4 Electrical devices should be plugged directly into the nearest outlet without using an extension cord. Many use surge protectors.
- 5 Use ground fault interrupters (GFIs) on all classroom laboratory electrical outlets.
- 6 Use only electrical devices that have a three-prong (grounded) plug.
- 7 Remind students not to insert any object into an electrical outlet.
- 8 Use plastic covers over sockets not in use.
- 9 Never run a piece of electrical equipment near water.

B Glassware

- 1 Prevent student injuries from sharp edges on mirrors, prisms, and glass plates. Remove sharp edges by grinding or by using an emery cloth or carborundum stone, or by having the edges painted with quick-drying enamel or nail polish.
- 2 Never attempt to insert glass tubing with a jagged end into rubber stoppers or tubing. Edges should be fire-polished. When inserting the tubing into a stopper or cork, always aim the tubing away from the palm of the hand. Lubricate the glass to be inserted with a small quantity of glycerin or petroleum jelly. Do not let students do this.
- 3 You must have a separate disposal system for broken glass.

C Small Power Tools and Equipment

A variety of small power tools, appliances, or equipment may be found in classrooms. Three-prong plugs should be used on all power tools to reduce the chance for electrical shock. Extension cords should not be used. Special care should be taken to avoid contact with moving parts or heating elements of any equipment. The following items should be used with caution: heating elements for fish tanks, small motors, soldering irons, hot plates, and electrical fans.

D Hand Tools

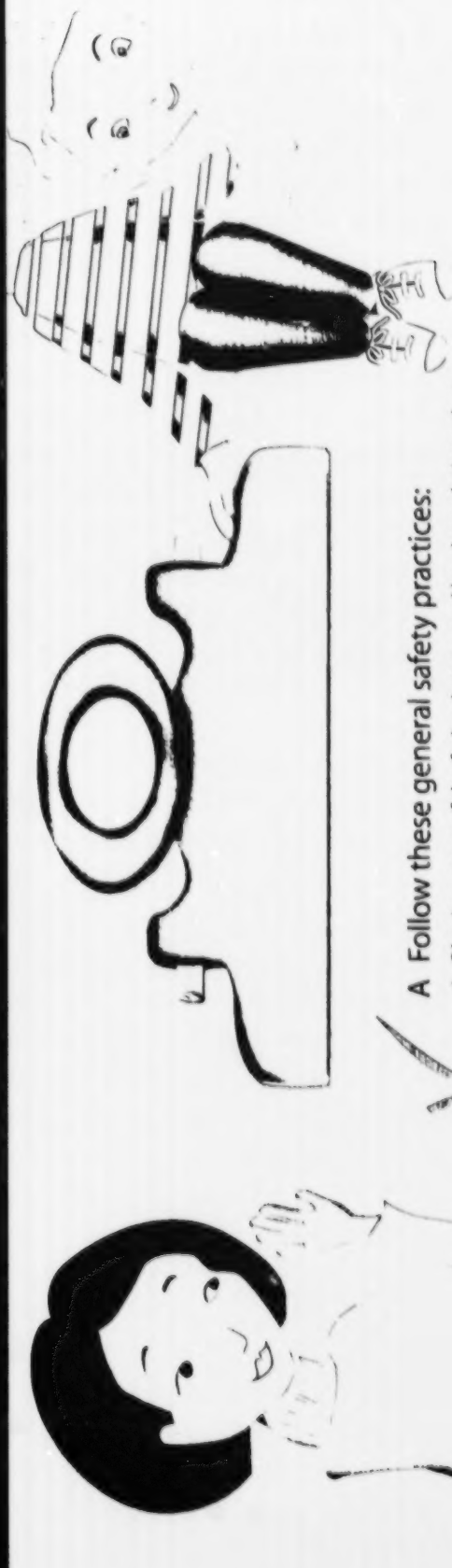
Many hand tools are used in science activities. The best situation includes a workbench that provides a suitable work surface and storage facilities for tools. Hand tools are designed for specific purposes and should be used only for those purposes.

E Pencil Sharpeners

The pencil sharpener does not seem a likely hazard, but students have been known to suffer eye damage inadvertently inflicted by the point end of an extra pencil in the hand turning the crank. Locating the pencil sharpener below eye level, preferably at tabletop level, will minimize such accidents.

References: *Flinn Chemical Catalog/Reference Manual* (2000). Flinn Scientific Inc., P.O. Box 219, Batavia, IL 60510.
Handbook of Laboratory Safety, A.K. Furr, 5th edition (2000). CRC Press, Boca Raton, FL 33545.

Notes _____



A Follow these general safety practices:

- 1 Obtain a copy of the federal, state, and local regulations that relate to school safety, as well as a copy of your school district's policies and procedures. Pay special attention to guidelines for occupancy loads, goggle legislation, and right-to-know legislation.
- 2 Know your school's policy and procedure in case of accidents.
- 3 Check your classroom regularly to ensure all possible safety precautions are being taken. Store equipment and materials properly; do not leave hazardous materials exposed in the classroom.
- 4 Before handling equipment and materials, familiarize yourself with their possible hazards. Review material safety data sheets (MSDS) for hazardous chemicals.
- 5 Do not use alcohol burners. Many schools do not allow any open fire at elementary levels. Be extra cautious if you deal with any fire, and instruct your students about appropriate precautions. Be certain fire extinguishers and fire blankets are nearby, and know how your school district wants you to use them.
- 6 Be familiar with your school's fire regulations, evacuation procedures, and the location and use of firefighting equipment. Hold evacuation drills to deal with emergencies.
- 7 At the start of each science activity, instruct students about potential hazards and the precautions to be taken.
- 8 Limit the size of a group of students working on an experiment to the number that can perform the experiment safely, without confusion and accidents.
- 9 Plan enough time for students to perform experiments, then clean up and properly store the equipment and materials.
- 10 Instruct students never to taste or place in their mouths any substances used in the science laboratory setting.
- 11 Instruct students not to touch classroom substances or material without first obtaining specific instructions from you.
- 12 Instruct students to report all accidents or injuries—no matter how small—to you immediately. Make sure they know there is no penalty for this.

- 13 Instruct students that it is unsafe to touch their faces, mouths, eyes, and other parts of their bodies while they are working with plants, animals, or chemical substances and afterwards, until they have washed their hands and cleaned their nails.

B When working with chemicals:

- 1 Use chemical splash goggles.
- 2 Teach students not to mix chemicals just to see what happens.
- 3 Instruct students never to taste chemicals and to wash their hands after using chemicals.
- 4 With elementary school students, use vinegar or lemon juice for reactions calling for an acid.
- 5 Combustible materials must be stored in a fireproof metal cabinet equipped with a lock.
- 6 Chemicals should be stored under separate lock in a cool, dry place, but not in a refrigerator, unless it is specially designed for chemicals.
- 7 Store only minimum amounts of chemicals in the classroom. Discard carefully, in accordance with your school district policy, any materials not used in a given period, particularly if they could become unstable.

C Glassware is dangerous. Whenever possible, substitute plastic. However, when glassware is used, follow these precautions:

- 1 Don't heat hard glass test tubes from the bottom. They should be tipped slightly, but not in the direction of another student.
- 2 Tell students to report sharp edges on mirrors or glassware to the teacher.
- 3 Keep available a whisk broom and dustpan for sweeping up broken glass, and place broken glass in a separate disposal container.
- 4 Warn students not to drink from glassware used for science experiments.
- 5 Use thermometers filled with alcohol, not mercury.

D Teachers and students should be constantly alert to the following safety precautions while working with electricity:

- 1 Teach students to use electricity safely in everyday situations.
- 2 At the start of any unit on electricity, tell students not to experiment with the electric current of home circuits.
- 3 Check your school building code about temporary wiring for devices to be used continuously in one location.
- 4 Electrical cords should be short, in good condition, and plugged in at the nearest outlet.
- 5 Tap water is a conductor of electricity. Students' hands should be dry when touching electrical cords, switches, or appliances. Have ground fault interruptors placed near water sources.

E Class size. The strongest correlate of accidents is crowding. Make sure you have enough space to do your lab safely.

Notes _____

24

Safety Checklist

This 2003 edition of *Safety in the Elementary Science Classroom*, the third, has been updated by Juliana Texley, Nina Visconti-Phillips, College of New Jersey; Frances Scelsi Hess, Cooperstown High School, NY; Kenneth Roy, Glastonbury High School, CT; and chair, NSTA Safety Advisory Board.

The first edition of *Safety in the Elementary Science Classroom* was prepared in 1978 by Robert A. Dean, Melanie Messer Dean, and LaMoine L. Motz. The second edition was revised and updated by Robert A. Dean, co-director of the Program of Teacher Enhancement in Science and Technology, University of California, San Diego; Melanie Messer Dean, director of the Program of Teacher Enhancement in Science and Technology, University of California, San Diego; Jack A. Gerlovich, Iowa Department of Public Instruction; and Vivian Spiglanin, science mentor teacher, Redondo Beach Elementary School District, CA.

This NSTA publication gives elementary school teachers suggestions on providing a safe environment for their students. The information is intended as a guide rather than an exhaustive study. For more extensive coverage of elementary classroom safety, refer to *Exploring Safety: A Guide for Elementary Teachers* by Terry Kwan and Juliana Texley, another NSTA Press publication.

Safety in the Elementary Science Classroom has been printed as a flip chart so it can be posted in the classroom and referred to frequently. Further references on specific safety issues should be found in school professional libraries, and the editors advise teachers to use these references as they plan activities and explorations.



How can you and your students avoid searching hundreds of science web sites to locate the best sources of information on a given topic? SciLinks, created and maintained by the National Science Teachers Association (NSTA), has the answer.

In a SciLinked text, such as this one, you'll find a logo and keyword near a concept your class is studying, a URL (www.scilinks.org), and a keyword code. Simply go to the SciLinks web site, type in the code, and receive an annotated listing of as many as 15 web pages—all of which have gone through an extensive review process conducted by a team of science educators. SciLinks is your best source of pertinent, trustworthy Internet links on subjects from astronomy to zoology.

Need more information? Take a tour—<http://www.scilinks.org/tour/>

Copyright ©1978, 1993, 1997, 1999, 2003, National Science Teachers Association, 1840 Wilson Boulevard, Arlington, VA 22201-3000. This booklet may not be reproduced in whole or in part without written permission from the publisher.

Design and illustrations, Linda Olliver

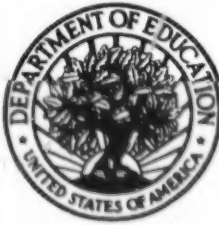
Stock # PB030X2

ISBN 0-87355-224-5

05 04 03 5 4 3 2 1

NSTApress®
NATIONAL SCIENCE TEACHERS ASSOCIATION

25



U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)



NOTICE

Reproduction Basis

- ☒ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.
- ☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").